Field Sampling Plan

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SAMPLING AND ANALYSIS PLAN

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This Land and Chemicals Division Generic Field Sampling Plan provides guidance for the preparation of project-specific field sampling plans (FSPs) for the collection of environmental data. Default generic sampling and analytical protocols are included which may be used verbatim or modified based upon project-specific data quality objectives (DQOs – See Generic QAPP). The goal of this document is to promote consistency in the generation and execution of sampling and analysis plans and thus to help generate chemical data of known quality for its intended purpose.

This manual applies to all LCD sampling events conducted by EPA Region 5 Land and Chemicals Division Staff having responsibility for sampling and analysis of environmental samples within their branch. This includes, but is not limited to RCRA Branch inspectors, Remediation and Reuse Branch (RRB) project managers, Chemicals Management Branch inspectors, and others having activities pursuant to and in support of execution of the following programs: the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). **Areas in RED FONT are generic items requiring change, when made specific to a particular site or facility sampling event.**

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LIST OF ACRONYMS

CFR	Code of Federal Regulations
CRL	Central Regional Laboratory (Change laboratory if necessary)
LCD	Land and Chemicals Division
PPE	Personal Protective Equipment
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QMP	Quality Management Plan
RCRA	Resource Conservation and Recovery Act
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
TCLP	Toxicity Characteristic Leaching Procedure
U.S. EPA	Environmental Protection Agency

1. INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared by the United States Environmental Protection Agency (U.S EPA) as a project planning document for the **SAMPLING AND ANALYSIS of Mercury** at **Veolia ES Technical Solutions, L.L.C., (Veolia)** located at **7 Mobile Avenue, Sauget, Illinois**.

This SAP summarizes the field and laboratory tasks necessary to sample and analyze **total mercury**. The objective of this effort is to determine if **the concentration of total mercury in a sample of prepared solution to be used as spike material during a test burn is comparable to the concentration expected based on a mass balance of the spike preparation procedure.** Upon completion, the data will be used by the U.S. EPA to assess **the applicability of the mercury spike solution for evaluating mercury feedrates during an upcoming test burn under the CAA MACT.**

The U.S. EPA Region 5 LCD Quality Assurance Project Plan (QAPP) **for this site** presents detailed information about U.S. EPA's quality assurance (QA) and quality control (QC) protocols for sampling and analysis activities in Region 5. This site-specific SAP will supplement the plan with information that is specific to this project. Both this site-specific SAP and the QAPP are subordinate to, and consistent with, the U.S. EPA Region 5 LCD Quality Management Plan (QMP) of May 2008.

The QMP establishes U.S. EPA Region 5 LCD's quality system for sampling work assignments. The QMP also defines requirements for control of accountable documents and records, provides the strategy for assessing the effectiveness and implementation of the overall quality system, describes the roles of and interrelationships between the various QA/QC plans, and describes how the quality of work will be controlled.

This SAP is a sub-tier document to the QAPP, which outlines the general requirements and protocols for waste sampling and analysis activities performed by U.S. EPA Region 5 LCD. The QAPP was designed to comply with and support the Region's quality management policies as prescribed in *EPA Requirements for Quality Assurance Project Plans* (QA/R-5), *EPA Guidance for Quality Assurance Project Plans* (QA/G-5), *EPA Quality Manual for Environmental Programs (EPA 5360)*, and *Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs* (ANSI/ASQC E4-1994). In addition, the QAPP provides guidance and requirements for developing and implementing site SAPs that are also compliant with these reference documents.

The remainder of this document describes the tasks associated with sample collection, handling, shipment, and analysis.

1.1 PROJECT HISTORY AND SUMMARY

Veolia is planning to conduct a compliance test burn under the CAA MACT for hazardous waste combustors in mid-September 2013. During the test burn, mercury, among other metals, will be fed to the incinerators in order to assess compliance with the CAA MACT. To mimic the combustion of mercury-containing wastes, Veolia will prepare a spike solution on or about August 27th, 2013 and add plastic vials of such solution to the feedstreams burned during the test.

1.2 PURPOSE OF THE STUDY

Analysis of a sample of the spike solution will confirm whether or not the spike solution preparation procedure included gross mistakes such that the concentration determined by mass balance is inaccurate.

1.3 SAMPLING AREA

EPA will observe the spike solution preparation procedures and ask the facility to provide a small sample of the solution for EPA as a split sample.

1.4 FIELD SAMPLING AND ANALYSIS PLAN ORGANIZATION

This SAP presents the methods used to conduct the field investigation, document the field activities, analyze the samples, and ensure the health and safety of the field team during sampling activities. Section 2 discusses field methods for sample collection and Section 3 describes the documentation and reporting requirements for the project. Section 4 refers to the laboratory procedures and analyses and Section 5 discusses the health and safety measures that will be followed by the Project Team Members in the field.

1.5 PROJECT TEAM

The project team is as follows:

Todd Ramaly & or Chris Lambesis, Project Managers, U.S. EPA, Region 5, Chicago
Jamie Paulin, RCRA Compliance Section 1 , LCD, Assigned QA Contact, and LCD/CRL Coordinator, U.S. EPA, Region 5, Chicago
Amanda Wroble, Currently CRL QA Coordinator, U.S. EPA, Region 5, Chicago

2. SAMPLING AND ANALYSIS

2.1 CONTAMINANTS OF POTENTIAL CONCERN (FILL IN YOURS)

Total mercury in an aqueous solution.

2.2 PROPOSED SAMPLING LOCATIONS

The sample will be collected by Veolia laboratory personnel from prepared spike solution within the on-site laboratory and handed to EPA.

2.3 SAMPLE DESIGNATION AND PROCESSING

A unique log number is assigned to each sample by the Project Manager assigned to this project. These log numbers are then recorded by the sampling team on sample tags, in the field log books, on the chain of custody sheets, and on appropriate laboratory data sheets.

The sample will consist of a single container, preferably the type of spike vial used by the facility for the test burn and a sample tag will be attached. The **sample vial or container will** then be placed in **a** plastic bag. Bubble wrap will be used to surround **the sample to** protect it from breakage. All samples will be labeled and identified in accordance with section 3.1.

2.4 EQUIPMENT DECONTAMINATION ENTER IF REQUIRED

No special equipment will be used during the sampling. Therefore, equipment decontamination is not anticipated.

2.5 CONTAMINATED EQUIPMENT MANAGEMENT

No equipment will be used by EPA to collect the sample as the facility will collect the split sample for us while we observe.

2.6 SAMPLE DOCUMENTATION AND CHAIN OF CUSTODY

Chain-of-custody forms, sample labels, custody seals, and other sample documents will be completed as specified in the Quality Assurance Project Plan (QAPP). Copies of the chain-of-custody forms will be retained with the project files. The sample team or any individual performing a particular sampling activity is required to maintain a field logbook. These field logbooks will be bound, and contain entries of investigation operations as the activities proceed. The logbooks are expected to be maintained by the Project Manager or his designee.

3. PROJECT DOCUMENTATION, SAMPLING, AND REPORTING

3.1 PROJECT DOCUMENTATION

The primary types of documentation that will be used for this project include field logbooks, photographs, photo logs, sample log forms, and sample tracking forms. The field logbooks are vital for documenting all on-site activities. Photo documentation will be used to provide an

accurate account of the material sampled, sample locations, and environmental conditions. Sample log forms are used to summarize data collected for various sample locations. The field logbooks are used to document any modifications made to the original project plans during field activities. Sample tracking forms include the chain-of-custody form, sample labels (or tags), and custody seals. The chain-of-custody form is used to track sample custody, which is an important aspect of field investigation activities that documents the proper handling and integrity of the samples. Sample labels are used to provide essential information and identification for all samples collected during field activities. Custody seals are used on all sample shipments to detect any tampering that may have occurred during transport or shipment. A description of each of these documentation methods is provided in the following sections.

3.1.1 Field Logbooks

The field logbooks will be used to document all field sampling activities performed at the project site. The logbooks will contain the date, time, and description of all field activities performed; names of personnel; weather conditions; the names of visitors to the site; areas where photographs were taken; and any other data pertinent to the project. The field logbooks will also contain all sample collection and identification information and a drawing of the area sampled, along with the approximate location of where each sample was taken. The sampling information will be transferred to sample log forms when the sampler returns to the office. The logbook is the official, legal record of site activities, and will serve as the key to sample designations and locations, and will include the date, time, site/sample location, sample identification number, sample matrix, how the sample was collected, any comments, and the sampler's name.

Each page of the field logbook will be numbered, dated, and signed by the author. The logbooks will be sturdy, preferably weatherproof, and bound to prevent the removal of pages. All writing will be done in waterproof, black, permanent ink. No pages may be removed from the field logbooks for any reason. Blank pages, if any, will be marked "page intentionally left blank." Any mistakes will be crossed out with a single line, initialed, and dated. If multiple logbooks are used, they will be numbered sequentially.

3.1.2 Photo Documentation

Photographs will be taken of the total sample area and of each sample. These photos will help identify the location and will provide an accurate visual record of the material being sampled. All photographs taken will be identified in the field logbooks (preferably in a separate section of the book set aside for that purpose). Photographic logs will contain, at a minimum, the film roll number, the photo number, the date, the time, the name of the photographer, and a description of the image in the photograph.

3.1.3 Sample Collection Information Form

Sampling logs and collection forms will be used to document site and sample characteristic data, which should agree with the information recorded in the field logbooks. Field personnel are

required to fill out one sample log form for each sample collected. These forms will be stored in the project file. A copy of these forms will also be included in the final data report and other documents, as appropriate. At a minimum, the log for each sample will contain the sample number, the date and time of sample collection, and a description of the sampling site, as well as the physical characteristics of the sample, the name of the sampler(s) and the name of the person recording the observations.

3.1.4 Field Change Procedure

When in the field, it may be necessary to deviate from the procedures outlined in this plan. It will ultimately be the responsibility of the Project Manager to decide when such changes are to be made. When it becomes necessary to modify a program or task, the changes will be documented in the field logbook. All field changes will be numbered consecutively starting with the number 001.

3.1.5 Sample Tracking Forms

Sample tracking is an important aspect of field investigation activities, as it documents the proper handling and integrity of the samples. Sample tracking forms to be used for the project will include chain-of-custody forms, sample labels, custody seals, and sample summary logs.

3.1.6 Chain-of-Custody Form

Internal laboratory records will document custody of the sample from the time it is received in the lab through its final disposition. The chain-of-custody form will be filled out after the samples have been collected and will be double-checked prior to the transport of the samples to the laboratory. At a minimum, the chain-of-custody form will contain the following information:

- Name of project
- Names of samplers/processing personnel
- Sample identification numbers
- Sampling date
- Sampling time
- Number and type of containers per sample
- Analysis requested

3.2 SAMPLING DOCUMENTATION

The following sections describe documentation with sampling and handling procedures.

3.2.1 Sample Labels

Each lamp collected will be clearly labeled with a handwritten Region 5 sample tag. The tag will be attached to the lamp itself. Waterproof black ink will be used to mark the tag. Sample labels will contain the following information:

- Sample identification numbers
- Sample date
- Sample time
- Preservation used, if any
- Analysis requested
- Initials of samplers/processors

Information on the sample label must match the information on the chain-of-custody form and in the field logbook for each sample.

3.2.2 Custody Seals

Custody seals will be used on the vial or container containing the sample. If coolers are used to aid in transport, custody seals will be attached to each cooler to detect any tampering during shipment. The seal numbers of each lamp will be recorded on the chain-of-custody form.

3.2.3 Sample Summary Log

Sample summary logs will be maintained by the Assigned QA Contact and used to keep track of all phases of the sampling and analysis process for all individual samples. The summary sample logs will include sample collection dates, sample delivery dates, and dates analytical results are received, along with any other relevant information.

3.2.4 Sample Custody/Tracking Procedures

The samples collected must be traceable from the time they are collected until they or their derived data are used in the final report. In general, the following provisions apply to sample handling:

- The Project Manager will be responsible for the care and custody of the samples collected until they are properly transferred or dispatched to the laboratory.

- All appropriate documentation forms will be used, including sample labels, chain-of-custody forms, sample logs and any other appropriate forms. Documentation will be completed neatly using waterproof, black ink.

- When transferring possession of samples, the individuals relinquishing and receiving them will sign, date, and note the time on the chain-of-custody form.

- Samples will be packed in plastic bags, each bag will be taped shut and sealed with an EPA custody seal. The seal number will be recorded on the chain-of-custody form. The bagged samples may be placed in cardboard boxes with bubble wrap to prevent damage of the lamps in transit. The cardboard boxes will be securely sealed with packing tape.

- A copy of the chain-of-custody form will be retained by the Project Manager for inclusion in project records.

All samples will be transported to the CRL by the Project Team and hand delivered to the laboratory.

3.3 REPORTING

Reporting for this project includes laboratory reports and the final report. CRL will prepare all reporting for laboratory activities.

3.3.1 Laboratory Reports

Final written laboratory reports will be required for chemical analyses. A laboratory report will be prepared by CRL for all laboratory procedures. Final written laboratory reports and data deliverables should contain the following, as applicable based on the method applied:

3. Case narrative

4. Identification of all protocols

5. Summary results of initial and continuing calibration

6. Method and instrument blanks

7. All field sample and field QA/QC sample results

8. Supporting raw data and spectra

9. Supporting sample tracking information (e.g. shipping forms, chain-of-custody forms)

10. Supporting documentation on any corrective actions

Initial calibration information must include concentrations of each standard analyzed, response factors for each analyte at each standard concentration, relative standard deviation (RSD) (or correlation coefficient for metals analytes) and over all standards for individual analytes. The RSD control limit range must also be indicated in the initial calibration summary data.

Continuing calibration information must include the response factor for each analyte, and the calculated percent difference as compared to initial calibration. Control limits for each analyte must also be indicated on each continuing calibration summary data sheet.

Method blank and field sample data pages must indicate the method reporting limit and the dilution factor. Surrogate reporting forms must list control limits for surrogate recovery. Spike reporting forms (blank and matrix spikes) must indicate spike percent recovery and relative percent difference control limits (if spikes are analyzed in duplicate).

Documentation of detection limits (detection limit studies) and results of performance evaluation samples (supplied by regulatory agencies or purchased from certified vendors) are not required for the data deliverable. However, these records must be supplied upon request. Total measurement error determination for field duplicate samples will be calculated. Electronic data deliverables will also be required.

3.3.2 Quality Assurance Report

No separate Quality Assurance Report is expected for this project. The final report will include a section on quality assurance. The Project Manager will prepare this section based upon activities involved with the field sampling and review of the CRL laboratory analytical data. The laboratory quality assurance/quality control (QA/QC) reports and any data package validation reports will be incorporated into the QA section by reference. This section will identify any field and laboratory activities that deviated from the approved sampling plan and the referenced protocols and will make a statement regarding the overall validity of the data collected.

3.3.3 Final Project Report

A final written report will be prepared documenting all activities associated with collection, compositing, transportation of samples and chemical and physical analysis of samples. The chemical and physical laboratory reports (or appropriate summaries) will be included as appendices. At a minimum, the following will be included in the final report:

- Brief description of the project and its objectives
- Type of sampling equipment used
- Identification and description of protocols used during sampling and testing and an explanation of any deviations from the sampling plan protocols
- Description or summary of sampling and compositing procedures
- Descriptions of each sample (i.e., sample logs)

- Summary of methods used to locate the sampling positions and a discussion of the position accuracy
- A plan view of the project showing the actual sampling locations
- Summary of all test results and data (hard copy and electronic)
- QA

In addition to the items listed above, the final report will include an electronic file of sample location information (i.e., sample ID, sample type, coordinates and sample data).

4. LABORATORY ANALYSIS

The laboratory procedures associated with physical and chemical testing applicable to this project can be found in appendixes B and C of the QAPP. **FILL IN ANALYTICAL LAB METHOD** will be performed on all samples.

5. HEALTH AND SAFETY PLAN

This section describes the health and safety procedures which will be used for the project.

Standard safety practices as outlined in the EPA manual Safety and Health in EPA Field Activities will be followed during this survey.

For sampling activities, the field personnel will need to use the following PPE:

- Cold weather gear as appropriate to conditions
- Disposable rubber/latex or nitrile gloves
- Safety glasses with side shield
- full face respirator (if deemed necessary based on site conditions)
- Steel-toed safety boots

The following telephone numbers are for emergency services:

3. Police, Fire Department, Ambulance: 911

The following hospital will be used in case of an emergency:

Saint Louis University Hospital
3655 Vista Ave, St Louis, Missouri